Supplemental Material

Supplement 1:

Table S1. Main driving mechanisms (causes) of the ETCW in the Arctic (or NH) according to 95 different peer reviewed papers published in 1929–2020 (values in **bold** indicate dominant forcings).

Table S2. Gaps in air temperature variables in daily series analyzed in the study.

Table S3. 10-year monthly and annual means of air temperature (°C) in the analyzed Arctic stations in the ETCAW and CAW periods, and their differences (ETCAW–CAW).

Table S4. Extreme DDTV rises and drops in seasons in the analyzed Arctic stations in the ETCAW and CAW periods.

Table. S5. Relative frequencies of occurrence (in %) of DTR ≥15 °C, ≥10 °C and ≥5 °C in the analyzed Arctic stations during the ETCAW and CAW periods, and differences (ETCAW–CAW).

Table S6. Relative frequencies of occurrence (in %) of characteristic days in the analyzed Arctic stations during the ETCAW and CAW periods, and differences (ETCAW–CAW).

Supplement 2:

Fig. S1a. Maps of multiyear monthly (Jan, Jun) and annual (Year) Pearson correlation coefficients (r) between analyzed stations: BAR – Barentsburg, TIK – Tiksi, VRA – Ostrov Vrangel, COP – Coppermine, ILU – Ilulissat and the rest of the Arctic (area >50°N) for the period 1931–1950 based on data from 20CRv3 reanalysis (Slivinski et al. 2019). Coefficients above 0.44 are statistically significant at p = 0.05 level.

Fig. S1b. Maps of multiyear monthly (Jan, Jun) and annual (Year) Pearson correlation coefficients (r) between analyzed stations: BAR – Barentsburg, TIK – Tiksi, VRA – Ostrov Vrangel, COP – Coppermine, ILU – Ilulissat and the rest of the Arctic (area >50°N) for the period 1991–2010 based on data from 20CRv3 reanalysis (Slivinski et al. 2019). Coefficients above 0.44 are statistically significant at p = 0.05 level.

Fig. S2. Extreme DDTV rises (red) and drops (blue) in ETCAW (dark) and CAW (light) periods in (a) Barentsburg, (b) Kanin Nos, (c) Tiksi, (d) Ostrov Vrangel, (e) Coppermine and (f) Ilulissat. Numbers show difference between periods (ETCAW minus CAW) for the rise (upper row) and the drop (lower row).

Fig. S3. (a, b, c, d, e, f) Annual courses of relative frequency of occurrence (in %) of characteristic days in the analyzed Arctic stations during the ETCAW period. Order of characteristic days from coldest to warmest is shown from left to right.

Supplement 3:

Every 3 hours UTC animation of spatial pattern of: sea level pressure (SLP, in hPa); wind speed at 10 m a.g.l. (wspd, in ms^{-1}) and its direction; and air temperature at 2 m a.g.l. (T2m, in °C) in Northern Atlantic from 1948-03-12 to 1948-03-17 based on data taken from 20CRv3 reanalysis (Slivinski et al. 2019).